

REMARKS

This paper is submitted in reply to the Office Action dated January 17, 2006, within the three-month period for response. Reconsideration and allowance of all pending claims are respectfully requested.

In the subject Office Action, claims 1-19 and 31-32 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In addition, claims 31 and 32 were rejected under 35 U.S.C. § 112, first paragraph. Moreover, claims 1-9, 13-18, 20-29 and 31-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,307,487 to Tavares et al. in view of U.S. Patent No. 5,710,881 to Gupta et al.; claims 10-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tavares et al. and Gupta et al. and further in view of U.S. Patent No. 6,393,419 to Novak et al.; and claims 19 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tavares et al. in view of Gupta et al. and further in view of U.S. Patent Application Publication No. 2003/0120669 to Han et al.

Applicants respectfully traverse the Examiner's rejections to the extent that they are maintained. Applicants have canceled claim 32 and amended claims 1, 5-7, 16, 20-22, 27 and 31. Applicants respectfully submit that no new matter is being added by the above amendments, as the amendments are fully supported in the specification, drawings and claims as originally filed. For example, the Examiner will note that claims 5-7, 16, 20-22 and 27 have been amended to correct a typographical error, namely to replace the term "progress" with the term "process."

Now turning to the subject Office Action, and specifically to the §101 rejection, the Examiner will note that claims 1 and 5 have been amended to state that the method of accessing a data structure is a "computer-implemented" method. In addition, claim 31 has been amended to recite a "tangible computer readable medium" upon which the program code is borne, while claim 32 has been canceled. While Applicants maintain a traversal of the Examiner's §101 rejections, Applicants respectfully submit that the amendments to claims 1-19 and 31 address the Examiner's §101 concerns. Withdrawal of the rejection is therefore respectfully requested.

Next turning to the § 112, first paragraph rejection, the Examiner will note that the terms "signal bearing medium", "recordable medium" and "transmission medium" are no longer recited in claims 31-32, and as such, the Examiner's rejection is now moot. Applicants do note, however, that claim 31 has been amended to recite a "tangible computer readable medium," and Applicants respectfully submit that one of ordinary skill in the art would readily appreciate how to implement a "tangible computer readable medium." Given that the terminology is utilized in numerous patents issued prior to Applicants' filing date, and given that an Application is not required to disclose that which is already known in the art, Applicants submit that the Application is enabling as to the concept of a "tangible computer readable medium." Withdrawal of the Examiner's § 112 rejection is therefore respectfully requested.

Next turning to the art-based rejections, and specifically to the rejection of independent claim 1, this claim as amended recites a computer-implemented method of accessing a data structure that includes initializing a flux count associated with a data structure to an even value. The claim further recites, in response to a request to modify the data structure, sequentially and in order incrementing the flux count to an odd value, acquiring an exclusive serialization mechanism for the data structure, modifying the data structure, releasing the exclusive serialization mechanism, and incrementing the flux count to an even value. The claim also recites in response to a request to access data from the data structure, sequentially and in order copying the flux count to obtain a copy of the flux count, copying the requested data from the data structure to obtain a copy of the requested data, and determining that the copy of the requested data is valid if the copy of the flux count is an even value and the copy of the flux count is still equal to the flux count after the copy of the requested data is obtained.

In rejecting claim 1, the Examiner primarily relies on Tavares, and in particular, the disclosure in Figs. 6 and 7 and the accompanying text at col. 4, lines 15-49. However, as should be apparent from the cited passages, as well as elsewhere within the reference, Tavares discloses the use of two separate counters, a begin-update-counter 16a and an end-update-counter 16b. Claim 1, on the other hand, recites a single "flux count", and the

operations that are performed in the remainder of the claim are performed on the same, single "flux count."

For example, claim 1 recites that in response to a request to modify a data structure, the flux count is incremented to an odd value, and is then incremented to an even value. Since claim 1 recites that these steps are performed in response to a request to modify the data structure, and that these steps are performed "sequentially and in order", the claim necessarily requires that these incrementing steps are performed on the same flux count. In contrast, Tavares discloses in Fig. 6, and in the accompanying disclosure at col. 4, lines 15-23, that the begin-update-counter 16a is updated prior to modifying a database record, and the end-update-counter 16b is updated after modifying the database record. The updates are not necessarily to odd or even values, but since two counters are used, the updates will always set both counters to either odd or even values. As such, Tavares does not disclose two increment operations performed on the same count or counter in response to a request to modify a data structure.

Claim 1 also recites that in response to a request to access data from a data structure, the flux count is copied prior to copying the requested data, and then it is determined that the copy of the requested data is valid if the copy of the flux count is even and the copy of the flux count is still equal to the flux count after the copy of the requested data is obtained. Once again, these elements of claim 1 necessarily require the recited steps to be performed on the same flux count. In contrast, Tavares discloses in Fig. 7, and in the accompanying disclosure at col. 4, lines 24-49, that the separate counters 16a, 16b are compared by a reader, a sample is taken of the end-update-counter 16b, and the sample of the end-update-counter is compared to the begin-update-counter. These different operations necessarily require the use of two counters, and as such, Tavares does not disclose the determination of whether requested data is valid based upon whether the same count or counter is even and equal to a copy taken after a copy of requested data is obtained.

As such, Tavares does not disclose or suggest the use of a single flux counter capable of being incremented to odd and then even values when modifying a data

structure, or the analysis of a single flux counter when accessing the data structure to determine after the data structure has been accessed whether the flux counter is even and has not changed since before the data structure was accessed.

The Examiner also relies on Gupta in rejecting claim 1, primarily for the purpose of disclosing initializing a flux count to an even value, and disclosing the acquisition of an exclusive serialization mechanism in connection with modifying a data structure.

Irrespective of whether Gupta discloses these features, however, Gupta does not disclose a single flux count having the features recited in claim 1. Specifically, Gupta discloses a lock that comprises a suspend flag 160 and a count 178. The suspend flag 160 operates as a "lock" flag, while the count 178 maintains a count of the number of cached copies of a data block are currently cached by different processors (col. 10, line 57 to col. 11, line 41). The suspend flag 160, being a "flag" is either set or cleared, and thus does not operate as a "count" as it either has a 1 or 0 value. The count 178 tracks the number of cached copies, but is not used to track any information analogous to a flux count. The count is incremented whenever a processor obtains a copied cache, but is decremented when that processor releases its copy. Applicants can find no single element in Gupta that is manipulated in an analogous manner to the flux count of claim 1. Accordingly, Applicants submit that Gupta does not remedy the shortcomings of Tavares, and as such, the proposed combination fails to disclose or suggest each and every feature of claim 1.

Applicants therefore respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness as to claim 1. Moreover, Applicants can find no motivation in either Tavares or Gupta to modify Tavares to incorporate a single flux count that is manipulated in the manner recited in claim 1. Accordingly, Applicants respectfully submit that claim 1 is non-obvious over the Tavares and Gupta, and that the rejection thereof should be withdrawn. Reconsideration and allowance of claim 1, and of claims 2-4 which depend therefrom, are therefore respectfully requested.

Next with respect to the rejection of independent claim 5, this claim as amended recites a computer-implemented method of accessing a data structure. The recited method includes, in connection with modifying the data structure, updating a flux

indicator associated with the data structure from a first state to a second state prior to modifying the data structure to indicate that the data structure is in the process of being modified, and updating the flux indicator to a third state after modifying the data structure to indicate that the data structure is no longer in the process of being modified, wherein the third state is different from each of the first and second states. The recited method also includes, in connection with accessing data from the data structure, obtaining a first copy of the flux indicator in connection with obtaining a copy of data from the data structure, obtaining a second copy of the flux indicator after obtaining the copy of the data from the data structure, and determining that the copy of the data from the data structure is valid if the first copy of the flux indicator does not indicate that the data structure is in the process of being modified and if the first and second copies of the flux indicator have the same state.

In rejecting claim 5, the Examiner again relies on Tavares and Gupta, and in this regard, the Examiner is respectfully directed to the foregoing discussion of the workings of these two references in connection with claim 1. As noted above, Tavares does not disclose a single flux counter, and in this same regard, Tavares does not disclose a single "flux indicator" as is recited in claim 5. Claim 5 recites updating the same flux indicator from a first state to a second state, and then to a third state before and after modifying a data structure, where the second state indicates the data structure is in the process of being modified, and where the third state is different from each of the first and second states. Tavares uses two counters in connection with modifying a data record, with one counter being incremented before modifying the data record, and the other incremented after modifying the data record. Accordingly the reference does not meet the recited steps in claim 5 pertaining to modifying the data structure.

Likewise, claim 5 recites obtaining two copies of the flux indicator in connection with and after obtaining a copy of data from the data structure in connection with accessing the data structure, as well as determining that the data is valid if the first copy of the flux indicator does not indicate that the data structure is in the process of being modified and if the first and second copies of the flux indicator have the same state.

Tavares relies on a disparity in the values of two counters to indicate that data is being modified, and does not disclose or suggest any single indicator to perform this function.

Indeed, the Examiner appears to acknowledge the shortcomings of Tavares at page 7, stating that Tavares does not explicitly disclose one counter to decide first, second and third states.

Instead, the Examiner relies on Gupta for allegedly disclosing one counter (a lock flag) to decide the state of data before and after modification, relying in particular on Fig. 4 and col. 11, lines 30-53 of the reference. It is important to note, however, that Gupta discloses a single bit "suspend" flag which is set whenever a processor has an exclusive lock, and cleared after the processor releases its lock. The flag, being a single bit, is only capable of representing two states: set or unset. This flag is incapable of representing three separate states, where the third state is different from each of the first and second states, as required by claim 5. Put another way, if the suspend flag in Gupta is incremented from a "0" value to a "1" value, the next increment to the flag results in a "0" value, which is indistinguishable from the initial "0" value. Applicants' claimed flux indicator, on the other hand, is capable of representing more than three states, and doing so with a single indicator.

Accordingly, neither reference discloses a single indicator that is capable of being set to one of first, second and third states, where the second state indicates the data structure is in the process of being modified, and where the third state is different from each of the first and second states. Gupta consequently does not remedy the shortcomings of Tavares, and as such, the proposed combination fails to disclose or suggest each and every feature of claim 5.

Applicants therefore respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness as to claim 5. Moreover, Applicants can find no motivation in either Tavares or Gupta to modify Tavares to incorporate a single flux count that is capable of representing three or more states, and that is manipulated in the manner recited in claim 5. Accordingly, Applicants respectfully submit that claim 5 is non-obvious over the Tavares and Gupta, and that the rejection thereof should be

withdrawn. Reconsideration and allowance of claim 5, and of claims 6-19 which depend therefrom, are therefore respectfully requested.

Next, with respect to the rejections of independent claims 20 and 31, these claims recite in part the use of a flux indicator capable of indicating first, second and third states, where the second state indicates an associated data structure is in the process of being modified, and where the third state is different from each of the first and second states. As discussed above in connection with claim 5, a flux indicator as recited in these claims, along with the manipulations thereof recited in these claims, are not disclosed or suggested by Tavares or Gupta. Accordingly, claims 20 and 31 are non-obvious over the prior art of record for the same reasons as set forth for claim 5. Reconsideration and allowance of claims 20 and 31, and of claims 21-30 which depend therefrom, are therefore respectfully requested.

As a final matter, Applicants respectfully traverse the Examiner's rejections of the dependent claims based upon the dependency of these claims on the aforementioned independent claims. Nonetheless, Applicants wish to note that a number of these claims recite additional features that are neither disclosed nor suggested by the art of record, e.g., count values that are updated to different values in a set of values (claims 6-8 and 21-22), and a flux indicator implemented as a count value (claims 13 and 24). Therefore, these claims are patentable by virtue of these additional recited features.

In summary, Applicants respectfully submit that all pending claims are novel and non-obvious over the prior art of record. Reconsideration and allowance of all pending claims are therefore respectfully requested. If the Examiner has any questions regarding the foregoing, or which might otherwise further this case onto allowance, the Examiner may contact the undersigned at (513) 241-2324. Moreover, if any other charges or credits

are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,

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Date

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